USGS

WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2002NY7B

Title: Development of Methods to Distinguish Between Ruminant and Human Sources of Fecal Contamination in Watersheds

Project Type: Research

Focus Categories: Non Point Pollution, Waste Water, Water Quality

Keywords: fecal contamination, water quality management, Bacteroides

Start Date: 03/01/2002

End Date: 02/28/2003

Federal Funds Requested: $24,999

Non-Federal Matching Funds Requested: $33,475

Congressional Districts: NY 21, NY 22

Principal Investigators:
Karen Sklenar
University at Albany - State University of New York

Ellen Braun-Howland
University at Albany - State University of New York

Abstract

Problem: In order to reduce fecal contamination of water bodies, watershed managers first need to identify the sources of the contamination. Traditionally, results of fecal coliform and fecal streptococcus testing have been used. Since these groups are found in both humans and other mammals, watershed managers look to the ratio of fecal coliform to fecal streptococcus as a possible indicator of the source of contamination. Unfortunately, this is not a reliable approach for several reasons (APHA, 1998).

Objectives: The objectives of the project are:

1)To assess the effectiveness of the Bacteroides PCR test, coprostanol, and caffeine at identifying sources of fecal contamination in watersheds;

2)To compare the sensitivity of the Bacteroides PCR test, coprostanol, and caffeine with more established indicators of fecal contamination (total coliforms, fecal coliforms, E. coli, fecal streptococcus, enterococcus) under different seasonal and land use conditions;

3)To conduct a preliminary evaluation of the effect of agricultural best management practices on water quality downstream of farms in Albany and Rensselaer Counties.

The project will focus on the collection and analysis of samples collected from several stream stations in Albany and Rensselaer Counties.

Methods: For this project, we propose to assess the ability of a new, molecular-based PCR method to identify sources of fecal contamination in watersheds. This method identifies fecal contamination through the amplification of Bacteroides DNA. This method, while being able to identify the presence of fecal contamination, is exceptional due to its ability to quickly and efficiently identify the source of contamination as being human or ruminant.